SPACE INFRASTRUCTURE DEVELOPMENT

(PRESENTATION TO THE INTERAGENCY WORKING GROUP)

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AGENDA

- The Issue
- What Constitutes Leadership
- Current Posture
- Will Currently Planned Programs Help?
- The Space Infrastructure Concept
- Interplay with National Space Policy
- Recommended Wording

THE ISSUE

- Given that space leadership is mandated as a high priority **national goal**, how can the nation's resources be mobilized in order to support the space goals that lend substance and credibility to U.S. space leadership?

  - In this presentation, the tie-in between U.S. space leadership (both in fact and in perception) and the highest priority U.S. national goals is taken as a given. If this premise is not accepted, then some other overarching goal will have to be defined to serve as the basis for the sector-level* goal setting and for the corresponding programmatic and resource commitment decisions.

- Assumptions for the next five years:

  - Federal budgets constrained
  - Steady U.S. economic growth rate
  - International political alignments to remain essentially unchanged

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* The sectors comprising the U.S. space activity are the Civil, Military, Foreign Intelligence and Commercial Space sectors

WHAT CONSTITUTES SPACE LEADERSHIP ?

- Definition of ambitious sector level goals, imaginative missions bordering on the projected limits of the state-of-the art for the next 15 to 50 years;

- Timetable (phasing), taking into account the evolution of our capabilities, the **resources made available** and the activities of our competitors;

- Domestic and foreign perception that

  - We can deploy the space systems that support our proposed missions

  - We can support our allies in their endeavors consonant with our interests

  - We can discourage, deter, or preclude space activities opposed to our interests

  - We derive a preponderant share of the cultural, scientific and economic benefits from space activities, commensurate with our investments.

CURRENT U.S. SPACE POSTURE

(SUMMARY)

- Insufficient to support the overall goal of unquestioned U.S. world leadership

  - Sector-level goals not substantiated by resource commitments

  - Sustained Soviet military and civil thrusts, coupled with political and commercial initiatives

  - Growth in space capabilities by potential competitors

CURRENT U.S. SPACE POSTURE

- Insufficient budget provisions, even in the absence of significant future contingencies

- Confusion as to the relationship and priorities for military vs. civil space missions; manned vs. automated missions

- Severely constrained launch capabilities well into the 1990s, even though our technology is substantially ahead of Soviet launchers

- Soviet Union well ahead in launch capacity, robustness, flexibility and operational experience

- Discretionary Soviet capability growth may be used against U.S. security interests

- Political objections to military space control and to force application to / in / from space

CURRENT POSTURE (CONTINUED)

- Capability for Supporting allied missions is limited

- International cooperative programs (specifically the Space Station) are beclouded by controversy, delays and budget pressures

- Aggressive foreign competition in scientific, and commercial space endeavors

- Instrumented exploratory mission capability recognized as being of high caliber, but few new starts

- Lagging behind the Soviet Union in terms of manned space activities

WILL CURRENTLY PLANNED PROGRAMS HELP TO REGAIN OR RETAIN SPACE LEADERSHIP?

(SUMMARY)

- Not as currently planned and structured
  - Constrained launch capacity
  - Low priorities for space science
  - No consensus on civil space goals and/or manned space missions
  - Minimal contingency funding
  - Commercial initiatives lagging

WILL CURRENTLY PLANNED PROGRAMS HELP TO REGAIN OR RETAIN SPACE LEADERSHIP?

- Space science programs seriously threatened by funding constraints and by the lack of launch opportunities prior to the full shuttle recovery

- Aeronautics research is not being planned in proportion of its potential importance to both space activities and air transportation

- The space transportation program is unlikely to achieve its mandated goal of low-cost, high capacity, robust and flexible access to space before the late 1990s, even if the shuttle recovery program proceeds on schedule. No contingency plans for new delays or interruptions in the shuttle program.

- No systematic effort to develop long-term space mission infrastructure (Cf. Page 8)

- No consensus on long-range civil space goals and corresponding programmatic or funding commitments

WILL CURRENTLY PLANNED PROGRAMS HELP TO REGAIN OR RETAIN SPACE LEADERSHIP?

(Continued)

- Competition for funding between USAF and NASA preclude effective pursuit of joint programs

- No adequate program for manned military space mission exploration: capabilities and limitations of military crews in space

- No contingency funds available to the military to exploit opportunities or to respond to surprises/ contingencies

- Lack of adequate tie-in with the nation's educational establishments

- To date, no creditable plan for accelerating the commercial opportunities associated with space activities and/ launch and support services

THE SPACE INFRASTRUCTURE CONCEPT

- Space Infrastructure:

"Systems that contribute to the performance of space missions but are not expended or significantly degraded in the normal course of these missions."

"Can be used to support many missions and/or several mission types over long periods of time."

"Includes facilities, equipment, organization, the cumulative know-how and the non-recurring development, acquisition and deployment costs."

- In space, there is little infrastructure currently available as the legacy of long periods of accumulation Furthermore, space activities are inherently expensive in terms of infrastructure requirements.

- For these reasons, missions that attempt to build infrastructure at the same time as paying for the current missions are becoming **prohibitively expensive**.

INTERPLAY WITH NATIONAL SPACE POLICY

- Space infrastructure development expenditures may be as high as 65% of all space-related spending for the next 15 to 20 years.

- Infrastructure development should be paid out of capital funds. We propose to examine the mechanisms whereby this could be accomplished.

- If practicable, this approach would free the currently planned budgets to benefit the currently committed or planned mission equipments and operations.

RECOMMENDED WORDING

"For all three sectors of the U.S. Government space activity, acquisition programs shall be divided into two categories: (1) Space infrastructure development programs, aimed at providing systems to be deployed on the ground, in orbit around the Earth or in other locations, that contribute to, but will not be expended in the course of, the performance of space missions; and (2) Space equipment programs that will provide systems designed for a single mission and/or for an operating life cycle not exceeding ten years.

"The space infrastructure acquisition and deployment costs (including the non-recurring portions of development) shall be funded through long-term capital financing through a single agency. The space equipment programs shall be funded through the agencies responsible for the mission that is the primary user of the equipment.

"Both infrastructural elements and mission support services will be made available to commercial users on terms that favor the development of private U.S. space-related industry and the U.S. economic interests.

"The provisions of this section shall become operative subject to the approval of detailed implementation plans, to be submitted no later than 90 days following the date of this directive. The Interagency Group (Space) is reponsible for developing these plans and will submit the Terms of Reference therefore to the Senior Interagency Group (Space) within 21 days following this directive."

November 16, 1987

SIG(SPACE) POLICY TASKING

1. Present SIG(Space) with the guidelines and implementing policy details that would accompany the proposed goals represented in Issues 1 and 2:

- GUIDELINES langauage supplied by NASA for Issue #1

  -- Technology only

  -- Unspecified decision point for subsequent program commitment.

- No specific language proposed for Issue #2 except recognition that STS contributes to this goal.

2. "To the extent feasible within the next month, address the near- and far-term programmatic detail and budgetary implications associated with these goals."

- Near-term detail associated with Issue #1 is contained within the Pathfinder program (?)

- Programmatic detail (near- or far-term) not supplied for Issue #2.

- Far-term detail for Issue #1 depends on:

  -- Destination(s), duration, international cooperation, frequency, technology readiness, timing, etc.

  -- Magnitude of technology effort

  -- Elements of supporting infrastructure (ALS, Space Station, etc.)

3. Address other unresolved language in the POLICY section:

- Arms Control section (DOD/State/ACDA)

- Civil Earth Remote Sensing (OMB/State)

- "Commercial Goods and Services" (semicolon vs. period?) (Commerce/DCI/DOD)